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### (54) COVER TAPE FOR PACKING ELECTRONIC PART

#### (57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain a non-chargeable cover tape excellent in hermetic sealability and easy peelability and not fluffing pasteboard at a time of peeling by laminating a seal layer consisting of an ethylene polymer and a non-chargeable potassium ionomer in a specific ratio to apply activation treatment thereto.

**SOLUTION:** A seal layer consisting of 70-90 pts.wt. of an ethylene polymer selected from low density polyethylene and an ethylene/unsaturated ester copolymer and 30-100 pts.wt. of a non-chargeable potassium ionomer is laminated on a base material layer, if necessary, through an intermediate layer and subjected to activation treatment by corona treatment. The non-chargeable potassium ionomer used in the seal layer contains 10-30wt.% of unsaturated carboxylic acid and consists of two or more kinds of ethylene/unsaturated carboxylic copolymers different in the content of unsaturated carboxylic acid and 0.1-5wt.% of polyhydric alcohol can be compounded with the seal layer.

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**CLAIMS**

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[Claim(s)]

[Claim 1] a base material -- a layer -- the need -- responding -- the middle class -- minding -- low density polyethylene -- and -- ethylene - partial saturation -- ester -- a copolymer -- from -- choosing -- having -- ethylene -- a polymer -- (-- A --) -- 70 - 90 -- weight -- the section -- un--- electrification -- a sex -- a potassium - an ionomer -- (-- B --) -- 30 - ten -- weight -- the section -- from -- becoming -- a sealing layer -- a laminating - - carrying out -- becoming -- this -- a sealing layer -- activation -- carrying out -- having -- \*\*\*\* -- things -- the description -- \*\* -- carrying out -- electronic parts -- a package -- \*\* -- covering -- a tape .

[Claim 2] The covering tape according to claim 1 whose average unsaturated-carboxylic-acid content is 10 - 30 % of the weight and whose un-charging nature potassium ionomer (B) is an ionomer of two or more sorts of the ethylene and unsaturated-carboxylic-acid copolymers with which unsaturated-carboxylic-acid contents differ.

[Claim 3] The covering tape according to claim 1 or 2 whose un-charging nature potassium ionomer is an ionomer of the ethylene and the unsaturated-carboxylic-acid copolymer whose unsaturated-carboxylic-acid content is 13 - 30 % of the weight.

[Claim 4] A covering tape given in either of claims 1-3 which come to blend polyhydric alcohol with a sealing layer at 0.1 - 5% of the weight of a rate.

[Claim 5] The covering tape according to claim 1 whose activation is corona treatment.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the covering tape for the carrier tapes made of paper made continuously dotted with the receipt dead air space which contains chip mold electronic parts. In more detail, when it heat seals on this carrier tape pasteboard, it excels in sealing performance and easy-releasability, and when it exfoliates, pasteboard is related with the covering tape of the un-charging nature which does not carry out fuzz.

[0002]

[Description of the Prior Art] Chip mold electronic parts, such as a transistor, diode, and IC, prevent the contamination at the time of storage or transportation after the manufacture, and they are contained by the carrier tape which has receipt dead air space so that wearing to an electronic-circuitry substrate can be performed easily. After preparing the \*\*\*\* omission section with which pasteboard is continuously dotted as one of the structures of such a carrier tape, pasting up a back tape on one side of pasteboard, making the \*\*\*\* omission section into receipt dead air space and making chip mold electronic parts contain there, what is made to paste up a covering tape and is sealed is known.

[0003] As such a covering tape, in order to avoid the damage on electronic parts based on static electricity generating in the time of transportation or covering tape exfoliation etc., it asks for what is excellent in un-charging nature in the first place. Furthermore, it is called for that a covering tape exfoliates easily while seal nature with pasteboard is excellent. And when a covering tape is exfoliated, it is also called for that pasteboard does not carry out fuzz as dust does not adhere to electronic parts.

[0004] Although it can say that what blended the tackifier and the low-molecular mold organic antistatic agent with low density polyethylene, or ethylene and a partial saturation ester copolymer has moderate adhesive strength and un-charging nature, and is considerably excellent as a covering tape ingredient, we are anxious about the adhesive strength to pasteboard and the change of the antistatic engine performance with time based on the bleed out of an antistatic agent.

[0005]

[Problem(s) to be Solved by the Invention] Then, this invention persons inquired per [ in which pasteboard does not carry out fuzz ] covering tape ingredient, also when the antistatic engine performance continued at a long period of time, and it excelled in the sealing performance to pasteboard, and easy-releasability and it exfoliated from pasteboard. consequently, the covering ingredient of the following laminating configuration -- the above -- it came to find out having description and this invention was reached.

[0006]

[Means for Solving the Problem] this invention -- a base material -- a layer -- the need -- responding -- the middle class -- minding -- low density polyethylene -- and -- ethylene - partial saturation -- ester -- a copolymer -- from -- choosing -- having -- ethylene -- a polymer -- (-- A --) -- 70 - 90 -- weight -- the section -- un--- electrification -- a sex -- a potassium -- an ionomer -- (-- B --) -- 30 - ten -- weight -- the section -- from -- becoming -- a sealing layer -- a laminating -- carrying out -- becoming -- this -- a sealing layer -- activation -- carrying out -- having -- \*\*\*\* -- things -- the description -- \*\* -- carrying out -- electronic parts -- a package -- \*\* -- covering -- a tape -- be related .

[0007]

[Embodiment of the Invention] ethylene (polymer A) 70-90 chosen as the sealing layer of a covering tape from

low density polyethylene, ethylene, and a partial saturation ester copolymer in this invention -- weight -- the section -- desirable -- 75 - 85 weight section, and the un-charging nature potassium ionomer (B) 30 - 10 weight sections -- the constituent of 25 - 15 weight section is used preferably.

[0008] As the above-mentioned ethylene polymer (A), low density polyethylene or ethylene, and a partial saturation ester copolymer can be used. low density polyethylene -- a consistency -- 0.900 - 0.935 g/cm<sup>3</sup> -- desirable -- 0.905 - 0.930 g/cm<sup>3</sup> It is a thing and may be obtained by copolymerizing with ethylene and a with a carbon numbers of four or more alpha olefin by the thing obtained by the high pressure process, or inside and a low voltage method. The typical thing of the latter approach uses a high activity titanium catalyst or a metallocene catalyst, it is the approach of copolymerizing by the liquid phase or the gaseous phase, and such an approach is already learned well.

[0009] Moreover, as ethylene and a partial saturation ester copolymer, a partial saturation ester content is 5 - 20% of the weight of a thing preferably one to 30% of the weight, for example. As partial saturation ester, unsaturated-carboxylic-acid ester, such as vinyl ester like vinyl acetate, a methyl acrylate, an ethyl acrylate, isobutyl acrylate, acrylic-acid n butyl, a methyl methacrylate, and methacrylic-acid isobutyl, can be illustrated here.

[0010] a melt flow rate [ in / again / as an ethylene polymer (A) / 190 degrees C and 2160g load ] -- 0.1-200g/-- the thing for 1 - 50g / 10 minutes is especially desirable for 10 minutes.

[0011] The un-charging nature potassium ionomer (B) used for a sealing layer is a potassium ionomer by which some or all of ethylene, unsaturated carboxylic acid, or the ethylene copolymer that consists of other monomers as an arbitration component further was neutralized from the potassium, and what gives sufficient un-charging nature for a sealing layer, for example, 23 degrees C, and 1013ohms or less of surface resistivity in 30%RH seem to be preferably set to 1012ohms or less. Such an un-charging nature potassium ionomer can be obtained by adjusting whenever [ unsaturated-carboxylic-acid content and neutralization ] to the suitable range, although it changes also with existence of combination of an additive effective on the disposition that it is not charged, in a sealing layer. Although an acrylic acid, a methacrylic acid, a maleic anhydride, maleic-acid monoethyl, etc. can be illustrated as unsaturated carboxylic acid here, especially an acrylic acid or a methacrylic acid is desirable. Moreover, as the monomer besides the above which can serve as a copolymerization component, vinyl ester and unsaturated-carboxylic-acid ester which were mentioned above can be mentioned as an example of representation. Such other monomers can be contained in the inside of the above-mentioned copolymer, for example, 0 - 30% of the weight of a rate.

[0012] It is desirable to use the ionomer which neutralized two or more sorts of the ethylene and unsaturated-carboxylic-acid copolymers with which average acid contents differ with potassium ion as an un-charging nature potassium ionomer, and was obtained. Whenever [ by the potassium ion of two or more sorts of the ethylene and unsaturated-carboxylic-acid copolymers with which the differences of the acid content of the thing of two or more sorts of copolymers with which the acid contents for example, whose average acid contents are 11 - 20 % of the weight preferably ten to 30% of the weight differ as one example of such an ionomer, for example, the highest acid content, and the thing the minimum acid content differ two to 20% of the weight preferably 1% of the weight or more / average neutralization ] is 70% or more of mixed ionomer preferably 60% or more. In this case, when using what has a few average acid content, it is desirable to use together a disposition [ that it is not charged ] top agent like polyhydric alcohol. As other examples, whenever [ according / an acid content / to potassium ion of 15 - 25% of the weight of ethylene and unsaturated-carboxylic-acid copolymer neutralization ] is 70% or more of thing preferably 60% or more 13 to 30% of the weight. When using what has a few acid content also in this case, it is desirable to use a disposition [ that it is not charged ] top agent.

[0013] In addition to an ethylene polymer (A) and an un-charging nature potassium ionomer (B), various additives can be blended with a sealing layer. As such an additive, a glycerol, trimethylol propane, pentaerythritol, a disposition [ that it is not charged ] top agent like a polyethylene glycol, an antioxidant, various stabilizers, a slipping agent, a coloring agent, etc. can be mentioned. If especially a disposition [ that it is not charged ] top agent is blended at 0.2 - 3% of the weight of a rate 0.1 to 5% of the weight, for example, it is effective.

[0014] The covering tape of this invention forms the sealing layer which consists of the above-mentioned constituent, without minding through an interlayer, and carries out activation of the sealing layer. It is an

ingredient with the desirable for example, thermoplastics which was excellent in the mechanical strength as a base material, and suitable biaxially oriented films, such as polypropylene, polyethylene terephthalate, nylon 6, and Nylon 66. Moreover, as an interlayer used for arbitration, what raises the adhesive property of a base material and a sealing layer, for example, the thing previously illustrated as an ethylene polymer which is one component of a sealing layer, can be mentioned.

[0015] Although the thickness of each class in a covering tape is arbitrary, it is desirable that 10-50 micrometers and an interlayer make to 10-30 micrometers, and a sealing layer makes [ a base material ] especially 0-50-micrometer 1-200 micrometers [ 5-100-micrometer ] the range of 10-50 micrometers, for example. Such a covering tape can be obtained by the well-known laminating approach. For example, the approach of carrying out the extrusion lamination of the sealing layer on a base material, the approach of carrying out the co-extrusion lamination of an interlayer and the sealing layer on a base material, etc. can be mentioned.

[0016] When the laminated material obtained as mentioned above is used as a covering tape as it is, the bond strength to pasteboard is too small, and inferior to sealing performance. The fuzz of pasteboard can be prevented when it exfoliates from pasteboard, while giving the moderate adhesive strength to pasteboard by carrying out activation of this sealing layer. As activation, although there are corona treatment, ozonization, etc., corona treatment is the simplest and desirable. As corona treatment conditions, it is desirable to consider as the amount of discharge for 10-200W [m ] 2/preferably more than 5W [m ] 2 / part, for example.

[0017]

[Effect of the Invention] The covering tape of this invention has the property which was excellent as a carrier tape for an electronic-parts package. That is, when it uses for it as a covering tape for sealing this after containing electronic parts on the carrier tape which formed successively the dead air space for electronic-parts receipt obtained by pasting up a back tape on the pasteboard which prepared the \*\* omission section that there is nothing so that it may be dotted continuously, since the covering tape of this invention is excellent in un-charging nature, it can prevent damage on the electronic parts by the static electricity failure. Since it is a large temperature requirement, and can carry out a seal by moderate seal reinforcement and does not have the fall of seal reinforcement with the passage of time, either, when the resin coat of the above-mentioned pasteboard is carried out and the covering tape of this invention is heat sealed on such pasteboard, while sealing performance is excellent, exfoliation can also be performed easily. Moreover, a covering tape separates finely at the time of exfoliation, and does not start the fuzz of pasteboard at it.

[0018]

[Example] The class of ingredient used for each class of the layered product used in the example, lamination conditions, corona treatment conditions, the heat-sealing measuring method of a layered product on the strength, etc. are as follows.

[0019] 1. Layered Product Ingredient (1) Base-Material Layer : Biaxial-Stretching Polypropylene Film (20 Micrometers in TOH CELLO CO., LTD. Make, OPU-1, Thickness)

[0020] (2) Middle class : low density polyethylene (the Mitsui Petrochemical Industries, Ltd. make, Myra Son 16, 10 MFR=4g /, minutes)

[0021] (3) the sealing layer resin following -- (a), (b), and (c) from -- becoming constituent (a) An ethylene-vinylacetate copolymer (10 % of the weight of vinyl acetate contents, 10 MFR9g / minutes) .... 80 % of the weight (b) 15 % of the weight of the un-charging nature potassium ionomer following two kinds of ethylene methacrylic-acid copolymer \*\* methacrylic-acid contents, MFR 60g / 10 % of the weight of 10 minute \*\* methacrylic-acid contents, and MFR 1/1 mixture for 40g / 10 minutes -- potassium ion -- 83-mol % -- the neutralized ionomer .... 19 % of the weight and (c) A glycerol ..... Constituent which consists of 1 % of the weight (MFR=8g /, 10min)

[0022]

2. Lamination Conditions Equipment Modern Machinery Company Make Extruder 65MmPhi Ratio-of-Length-to-Diameter=28 Screw Three Stage Type CR=4.78 Die Inner Deckle Type Die Opening 0.8X500Mm Air Gap 120Mm Die Laying Temperature 230 Degrees C Line Speed A Part for 80M/[0023] 3. Corona Treatment Condition Equipment Corona Surface Treatment Machine Corona Voltage by Kasuga Electric Works, Ltd. 160V Current 10 A-Line Rate It is Corona Treatment Consistency by 40M/. 60W and Part / M2 [0024] 4. Heat-sealing measuring method on the strength Base material for a seal Carrier tape form (the Honshu Paper Co., Ltd. make, a HJ carry ATE PU form, and 580g/m2)

Seal conditions Seal pressure 0.2MPa Seal time amount 0.5 seconds Seal bar 10x300mm Tension test Speed of testing A part for 300mm/ Exfoliation include angle 180 degrees Test piece width of face 5mm [0025]  
 [Example] The 3 lamination film was created according to said lamination conditions using the ethylene copolymer / potassium ionomer constituent of the above (3) which carried out the extrusion lamination to 30-micrometer thickness as the low density polyethylene of the above (2) which carried out as a base material at PP biaxially oriented film of the above (1) of 20-micrometer thickness, and carried out the extrusion lamination as the middle class at 20-micrometer thickness, and a sealing layer.

[0026] About what performed corona treatment to this 3 lamination film and its sealing layer on said conditions, it heat sealed with the carrier tape form (Honshu Paper Co., Ltd. make), and heat-sealing reinforcement was measured. A result is shown in Table 1. that to which heat-sealing reinforcement [ as opposed to a carrier tape form in the 3 lamination film which performed corona treatment of this invention ] does not perform corona treatment -- comparing -- twice [ about ] -- improving -- in addition -- and the result that the reinforcement does not fall with time was obtained. Moreover, at the time of exfoliation, the covering tape separated finely, and the fuzz of pasteboard was not started.

[0027]

[Table 1]

シール温度 ℃	ヒートシール強度 (単位 : N/5mm)			
	コロナ 未処理	コロナ処理		
		1日後	7日後	30日後
100		0.5	0.7	0.8
120	0.9	1.6	2.0	1.7
140		2.0	2.3	2.1

[Translation done.]